



JTS Speaks Out on Use of Single Surgeon Teams

The JTS Committee on Surgical Combat Casualty Care (CoSCCC) has stepped up to address the risks involved with the increasing use of single surgeon teams (SSTs) in deployed environments. The intent is to inform medical leaders, medical planners, operational commanders, and those who generate Service requirements of the potential risks of overutilization of SSTs. An SST is a surgical team which consists of one qualified general surgeon with current and relevant trauma experience. The rise in SSTs is driven out of a necessity to meet operational demands. The realities of the deployed environment frequently require commanders and surgical teams to do more with less, while trying to mitigate risks and save lives. While SSTs unquestionably have a role, this is balanced with the risk of decreased capability and capacity. SSTs inappropriately trained, positioned, or supported by a robust system of care (to include casualty evacuation and resupply) will be rapidly task saturated and become mission ineffective; this can result in increased mortality from potentially survivable traumatic injuries.

CoSCCC highlights a number of key facts which influenced their position. Surgical teams are most effective when they can receive patients as soon as possible after injury. However, full multi-surgeon teams are a limited resource, which can lead to potentially dangerous delays between point of injury and treatment. SSTs therefore have the potential to fill the gap between point of injury and delivery of the patient to a Role 2 facility by providing immediate life-saving treatment in the shortest time possible after injury. Nonetheless, single surgeon teams remain fundamentally limited by their size. Limited resources and lack of redundancy means that SSTs are easily overwhelmed and cannot provide prolonged care for patients. SSTs are also limited in terms of

their interoperability in a joint environment, given that they are not standardized across the different branches of the service.

CoSCCC acknowledges that mobile SSTs, when located close to point of injury, can provide faster treatment for patients exhibiting mild to moderate injuries. With proper training, supplies, and support from medical evacuation assets, SSTs may be effective in mitigating the risks imposed by time and distance between the battlefield and more comprehensive care facilities. However, SSTs are not a substitute for traditional Role 2 surgical teams. When distance is not a factor, SSTs are associated with poorer outcomes overall than multi-surgeon teams, even if the casualty exhibits injuries which the SST is theoretically capable of treating. As such, standard Role 2 Teams are always preferable to SSTs, and if possible should be used in place of an SST in any given Area of Operations. If this is not possible, the SSTs must be employed in a manner which accounts for their inherent limitations. CoSCCC emphasizes that SSTs cannot exist as ad-hoc entities. The spontaneous formation of SSTs in theater (as has been the case in the past) increases risks across the board, from mission, to force, to the SST members themselves. CoSCCC believes that there will continue to be operational requirements for small, mobile surgical teams, which may involve SSTs. SSTs should therefore be organized, trained, and logistically integrated in advance, so that they can be utilized effectively with minimal risk to mission and force and maximum benefit to patients.

The CoSCCC paper includes a list of recommendations which cover logistical and training requirements and the need for standard, consistent capabilities. Read the report and its recommendations at https://jts.amedd.army.mil/assets/docs/cosccc/CoSCCC_Position_Statement_on_Single_Surgeon_Teams.pdf

CCMD Dashboards Offer 24/7 Access to Mission-Critical Data

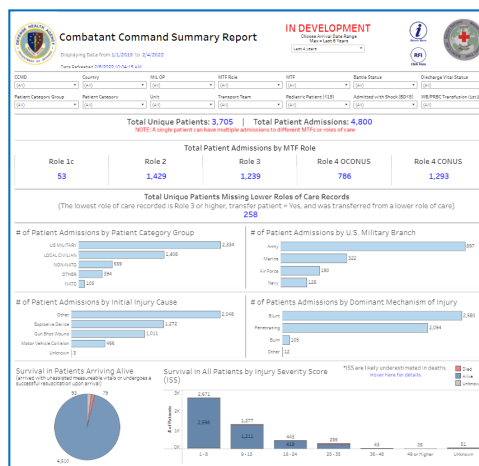
The Combatant Commands (CCMD) Trauma System (CTS) Operations Branch is working to make mission-critical data more accessible to CCMD surgeons to facilitate strategic and operational decision making efforts in their theaters of operation. CTS is collaborating with JTS data scientists to build interactive dashboards tailored to the unique needs of CCMDs. The initial JTS COVID-19 dashboards were so well received by DHA/DoD leadership and the community that JTS decided to expand its portfolio of dashboards for trauma care improvement and CTS trauma system management.

The CCMD dashboards will provide 24/7 access to invaluable insights and actionable data CCMD surgeons require to make informed decisions; these dashboards would replace quarterly reports to CCMDs. Traditional reports and high-level presentations were limited since the reports couldn't provide detailed comparisons of the military medical treatment facilities (MTF) within the CCMDs. Now CCMD leaders can dig deep into issues and identify associated data they can then request from JTS.

The CTS Branch included CCMD leadership in development discussions to determine what would be useful to them. Filters can narrow data to a specific CCMD MTF, patient group, time frame, and other criteria; users can view data for specific groups of casualties, time frames, or

outcomes; and the dashboard can display side-by-side comparisons of CCMDs, MTFs, and units. For example, CCMD leaders can examine their MTF volumes for each fiscal quarter over the last 6 years in one graph. The flexibility of the dashboard puts CCMD leaders in a position to provide educated answers to countless questions they may have about their trauma system's performance.

Preview of CCMD Dashboard



"The Chinese military strategist, Sun Tzu, famously said, 'If you know the enemy and know yourself, you need not fear the result of a hundred battles.' CTS dashboards will enable combatant commanders and surgeons to thoroughly study their medical readiness and outcomes of their patient care, thus, allowing them to implement process improvement measures," JTS CTS Operations Branch Chief COL Jay Baker stated.

"CTS dashboards are powerful tools to fulfill the JTS vision of 'every Soldier, Sailor, Airmen and Marine injured on the battlefield or in any theater of operations will be provided with the optimum chance for survival and maximum potential for functional recovery.'"



FROM THE DESK OF THE JTS CHIEF

The Rebuilding of DoD Trauma Registry

A few words from JTS Chief Col Stacy A Shackelford, USAF, MC, Trauma Surgeon

The DoD Trauma Registry (DoDTR) is the largest combat casualty care registry ever established. Data from the DoDTR has changed the face of combat casualty care and even civilian trauma.

Why do we need to mess with success and develop a “new registry?”

First, it is important to understand the difference between *the registry* as a complete capability and JTS registry software, a tool to facilitate our mission. The registry *capability* involves a complex team of management, registrars, quality assurance technicians, data sharing experts, data storage, information technology specialists, registry software staff and more. The registry software is an important piece of our capability but only one part of the system.

The JTS registry team has invested tremendous effort over the past two decades to tailor the registry to meet the DoD needs, update the data fields, and incorporate the internal logic that facilitates manual data abstraction. The team has also invested many hours to sustain the needed contracts and authority to operate the software on the DoD network. The current software is an outstanding platform to support manual data abstraction. Over the past 20 years, manual data abstraction has been essential to hunting down the bits of hand-written information needed to complete registry data.

What does the future of the DoDTR look like?

The Defense Health Agency (DHA) is working to re-establish the DoDTR and pandemic registry on a DHA platform that accepts data from more sources. One such source is the Military Health System (MHS) information platform (MIP), a cloud-based medical information space which consolidates data from electronic health records and other data sources. An example of another data feed is the Defense Casualty Information Processing System (DCIPS). DCIPS is the single authorized system for casualty reporting in the DoD which tracks casualty data pertaining to service members and their families. JTS is working to establish a data-sharing agreement with DCIPS to allow transfer of data on reported casualties. This is the denominator. JTS needs to identify all casualties, including ones that were previously missing records.

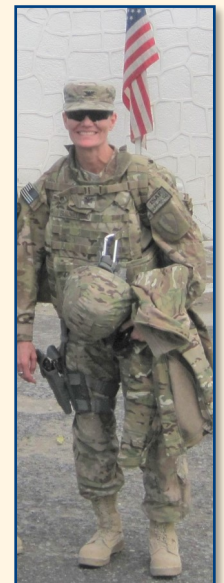
Lessons from the pandemic registry development project have given us a glimpse of what a war with a large number of casualties will look like.

Rapid data processing to support leadership decision making is essential. Rapid shifts in injury patterns can only be detected at the speed of acquiring and analyzing available data. The DoD requires immediate data collection and analysis that can only occur with pre-established data feeds into a registry with performance metrics consolidated onto dashboards. From the JTS perspective, we understand that this type of data transfer from multiple sources is less detailed and, in some cases, less accurate than manually abstracted data. However, rapid data collection on large numbers of casualties has been integral to the pandemic response and will be essential in future conflicts.

The JTS mission has expanded to become the “reference body for trauma” for the entire DoD. This means JTS must increase its data involving all DoD trauma care, including in-garrison care, training accidents, and all deployed environments. Such large-scale data can only be collected through automated processes, understanding that this is surveillance-level data from electronic health records that may contain inaccuracies, such as diagnosis codes assigned by physicians.

What will happen with manually abstracted data? This will remain the *gold standard* and will be essential to improving casualty treatment and outcomes over the long term. Detailed data collection and accurate coding remain the core of the DoDTR. We understand that such data collection can only occur at a limited speed with approximately a 2-month delay in reporting. However over the long run, this detail is needed to drive performance improvement and clinical practice guidelines.

We envision a future where a combination of better electronic documentation at the point of care, consolidation of electronic health records into MHS Genesis, partial automation of data collection where it can be done accurately, and augmented data collection with accurate coding by highly trained registrars leads to a complete picture of trauma in the DoD.



LEARN ABOUT JTS AND WHAT WE DO

PJ Medcast Interview with JTS Chief Col Shackelford:
<https://afspecialwarfare.com/217-the-joint-trauma-system/>

JTS Chief Col Shackelford and Deputy Chief Dr. Spott talk pandemic data management:
<https://governmentciomedia.com/military-health-summit-joint-trauma-system-chiefs-talk-pandemic-data-management>

NEW
CPGs



[Prolonged Casualty Care Guidelines, 21 Dec 2021](#)

[Tactical Combat Casualty Care Guidelines, 15 Dec 2021](#)

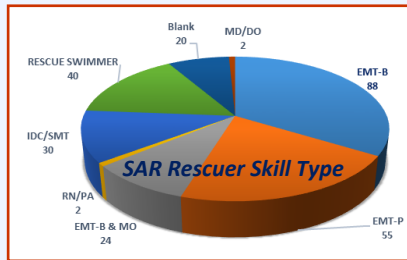
[Mechanical Ventilation Basics, 27 Dec 2021](#)

JTS Analyzes Search and Rescue After Action Reports to Uncover Deficiencies, Develops Performance Improvement Metrics

The JTS PI and CTS Operations branches published in-depth review of after action reports (AARs) from over 252 search and rescue (SAR) missions from 2018 - 2021. The report is in response to the U.S. Navy SAR's request that JTS assess its operations. It analyzes the context in which Naval SAR operations occurred as well as medical procedures and patient demographics. JTS identified deficiencies in equipment, personnel, and documentation and developed a list of PI metrics. The need for standardization is keenly felt in the field.

AAR comments reinforce the need for standardized equipment like cardiac kits, medication kits, and advanced life support tools. For example, SAR crews report they do not have the equipment or skills to perform rapid intubation of patients. The report was unable to conclude whether or not standardized medication kits are available to SAR teams. The report did find skills of attendant medical personal vary considerably across SAR missions. Thirty-one percent of missions were executed by a single EMT-B, while 19% were executed by a single EMP-P, and 17% were executed by two medical attendants. In some cases, both a registered nurse and physician were present, while other times only one was present.

JTS identified opportunities for improving documentation. Vague or incomplete information in the after action reports makes it more difficult to conduct accurate assessments. Accurate information is critical for mission success. Casualty classification was one area of deficiency. The report found that there is only an 81% overall accuracy in the casualty classification. This puts casualty classification high on the list of performance improvement (PI) priorities. Casualty classification includes all the critical information of the patient, most notably the type and severity of injury and location of the patient. It is imperative that patients are accurately classified at the start of the mission, since this determines everything from prioritizing patient care to the medical and logistical resources. A key metric for success is the comparison between the dispatched category and the assessed category of the casualty. Dispatch's casualty classification should match the classification assessed upon the arrival at the mission destination. Having accurate information upfront is critical for SAR teams to accurately triage the casualty in advance, which dictates urgency, timing, equipment, and all other areas of mission prep.



Inconsistent SAR documentation impacts the ability for SAR teams to record accurate information. For example, the DA4700 form has a list of specific mechanisms of injury (MOI), which are tailored towards battlefield en route care and not necessarily applicable to SAR operations. JTS reported roughly one fifth (55 out of 252 cases) of SAR cases recorded the MOI as either "other" or left blank. "Other" or left unchecked ultimately makes the data less useful and harder to interpret. In cases of hypothermia, the patient's temperature was only recorded in 13% of cases. An emphasis on documentation training may fill the gaps in SAR documentation.

The situation is further complicated by the fragmented nature of the available guidance for SAR teams. JTS discovered SAR teams rely on guidelines from multiple sources, bringing into question source credibility and guidance consistency.

The lack of training is at the root of the deficiencies. Additionally, actual mission engagements do not provide for redundancy which would lead to proficiency, proving that personnel training is of paramount importance. For instance, in one exercise, Special Operations assets had to be utilized for Casualty Evacuation (CASEVAC) purposes because the CASEVAC plan proved insufficient during the course of the exercise. The AARs recommended regular testing and evaluation of CASEVAC plans.

Response to the JTS SAR report has been positive and supportive. LCDR Paul Roszko, Director of Emergency Medical Services, Navy Medical Forces, called the report "excellent" and viewed the findings as an opportunity to improve trauma training across the Services. The report prompted Rosko to question why there is not standardized casualty cards or simulations. He would like to take real-life cases and turn them into vignettes or simulations for squadron training. JTS does include an example of a SAR casualty vignette as a tool to improve SAR training.

"The data is clear that the SAR community does a lot more than just treat trauma patients," said Rosko. "Perhaps identifying a few common medical cases or other types of commonly encountered injuries and specifying what our "standard of care" reference point is would allow the JTS PI team to provide more feedback on the quality of care provided."

JTS wants to acknowledge Navy SAR efforts in improving the quality of their patient care documentation, and will continue to support this special community with performance improvement review and analysis of patient care records.

Submit requests for the full report to: dha.ibsa.j-3.list.jts-prehospital@mail.mil

JTS SAR Recommendations

1. Encourage all rescuers to conduct and document mission debriefs using the DA4700 Patient Care AAR. This information is kept confidential and separate from the patient care record when submitted to the JTS. These comments are valuable to the individual team and can assist other rescuers in the form of retrospective lessons learned that we can collate in these type of reports to the field.
2. Review interoperability of equipment utilization across SAR units, standardization of equipment and supplies as well as of protocols (clinical practice guidelines [CPGs]) is helpful in ensuring best outcomes of casualties.
3. Consider standardization of medication kits that could be made available to the appropriate rescuers. The Standard Medical Operating Guidelines (SMOG) referenced previously has a published medication kit with list of meds and sample kit organization.
4. Consider a simple standardized list of mechanisms of injury that can be used to facilitate data analysis, training/education materials and essential task lists.
5. Consider using vignettes like the one included at the end of this report. Potentially use in table top exercises, simulated casualty rescue, etc. JTS is happy to create more.
6. Utilize the enclosed references (TCCC, SMOG, CPGs) to synchronize SAR specific clinical care policies, procedures and protocols.
7. Utilize the PI cases to highlight blood transfusion capabilities, protocols and training of rescue personnel.
8. Increase emphasis on the complete documentation of assessment findings (to include complete vital signs: HR, BP, RR, Temp, SpO2).
9. Consider increasing skill sets in the identification of possible TBI/ Head Injury and the subsequent interventions necessary to maximize the outcomes of these casualties.
10. Mandate 100% documentation of SAR missions and develop a central electronic portal for submittal. Routine reports such as this one will be more meaningful and can be used for operational/financial planning, education and training, and, protocol development within the SAR community.



DoD TRAUMA REGISTRY DATA IN ACTION

RESEARCH, STUDIES BASED ON DoDTR DATA

- Fisher AD, Paulson MW, McKay JT, et al. [Blood Product Administration During the Role 1 Phase of Care: The Prehospital Trauma Registry Experience](#). Mil Med. 2022 Jan 4;187(1-2):e70-e75.
- Le TD, Gurney JM, Akers KS, Chung KK, Singh KP, Wang HC, Stackle ME, Pusateri AE. [Analysis of Nonbattle Deaths Among U.S. Service Members in the Deployed Environment](#). Ann Surg. 2021 Nov 1;274(5):e445-e451.
- Lauby RS, Johnson SA, Borgman MA, Bynum J, Hill GJ, Schauer SG. [Analysis of Prehospital Administration of Blood Products to Pediatric Casualties in Iraq and Afghanistan](#). Prehosp Emerg Care. 2021 Sep-Oct;25(5):615-619.
- Stewart, I.J., Poltavskiy, E., Howard, J.T. et al. [The Enduring Health Consequences of Combat Trauma: a Legacy of Chronic Disease](#). J Gen Intern Med **36**, 713–721 (2021).
- Alcover KC, Ambardar SR, Poltavskiy E, et al. [Traumatic injury and atrial fibrillation among deployed service members](#). J Cardiovasc Electrophysiol. 2021 Sep;32(9):2590-2594.
- Cuenca C, Clarke E, Dengler B, et al. [An analysis of intracranial hemorrhage in wartime pediatric casualties](#). Physician's Weekly, Aug 5 2021
- Suresh M, Staudt A, Trevino J, et al. [Characteristics of burn casualties treated at role 2 in Afghanistan](#). Journal of Trauma and Acute Care Surgery, Aug 1 2021 91 (2S Suppl 2): S233-S240
- Hall AB; Qureshi I, Gurney JM, Shackelford SA, et al. [Clinical utilization of deployed military surgeons](#). J Trauma Acute Care Surg. Aug 2021; 91(2S): pS256-S260.
- Kotwal RS, Mazuchowski EL, Janak JC, et al. [United States military fatalities during Operation New Dawn](#). J Trauma Acute Care Surg. Aug 2021; 91(2): p375-383.
- Shackelford SA, del Junco DJ, Riesberg JC, et al. [Case-control analysis of prehospital death and prolonged field care survival during recent US military combat operations](#). J Trauma Acute Care Surg. 01 Aug 2021; 91(suppl 2).
- Gurney JM, Staudt AM, del Junco DJ, Shackelford SA, et al. [Whole blood at the tip of the spear: A retrospective cohort analysis of warm fresh whole blood resuscitation versus component therapy in severely injured combat casualties](#). Surgery. 10 Jul 2021; p1-8.
- Shackelford SA, Gurney JM, Taylor AL, et al. The [Joint Trauma System Defense Committee on Trauma, the Armed Services Blood Program. Joint Trauma System, Defense Committee on Trauma, and Armed Services Blood Program consensus statement on whole blood](#). Transfusion. 16 Jul 2021.
- DeStefano CB, Shaw K, Gundlapalli AV, et al. [Incidence of cancer among U.S. combat casualties: a DoD Trauma Registry study](#). J Am J Hematol. 2021 Sep 1;96(9):E324-E327.
- Klausner MJ, McKay JT, Bebartha VS, et al. [Warfighter personal protective equipment and combat wounds](#). Med J (Ft Sam Houst Tex). 2021 Apr-Jun;(PB 8-21-04/05/06):72-77. PMID: 34251669.

HOW TO REQUEST DoDTR DATA

The requestor must be U.S. Military, U.S. Government or sponsored by a U.S. Military or Government entity who will accept responsibility for safeguarding the data set and ensure all applicable DoD and Federal requirements are met by the non-Federal requestor.

JTS does not help non-Federal requestors find DoD sponsors. DHA requires the end user of the data to be identified.

Issuance of identifiable data for research purposes is subject to oversight by the Institutional Review Board (IRB). If the protocol was reviewed by a non-DOD primary IRB, the DHA Human Research Protections Program must review research documentation.

1. Complete the Request for Information Worksheet to request counts of patients and determine if the DoDTR offers enough information for a particular research or performance improvement project.
2. Complete the [DoDTR Data Request Form](#) to specify the data elements as listed in the approved protocol.
3. Complete a Data Sharing Agreement Application (DSAA) and submit it to the DHA Privacy Office with the above forms. DHA may determine a MOU/MOA. If one is needed, it must be signed prior to release of data. More requirements are listed in the [DSAA](#).
4. DHA Privacy Office approves the DSAA. Once JTS is notified of DSAA approval, data will be queried/reviewed and released.
5. For more information, email the Data Release Branch at: <mailto:dha.jbsa.j-3.list.jts-data-release@mail.mil>

COMING SOON: CCMD TRAUMA SYSTEMS (CTS) TRAINING

JTS is developing a CTS course for partners in accordance with DHA-PI 6040.06 Combatant Command (CCMD) Trauma System (CTS), 08 Sept 2020 which states all assigned CTS personnel will attend CTS-specific training to be hosted and funded by JTS. This course will be a mixture of on-line and in-person material. Intended audience: TMT members, JTS staff, and CCMD SG staff. The CTS team hopes the courses will be ready by late summer. Below is a planned curriculum under development.

DAY 1

- ◆ Introduction to Course: JTS/CTS leadership
- ◆ Trauma systems: Why have them?
- ◆ JTS 101: Overview of Defense Center of Excellence for Trauma
- ◆ Trauma Management Teams: What are they?
- ◆ Doctrinal products: DHA-PI and CONOPS: What they say and what they don't say
 - Trauma system capabilities
 - Trauma system core functions
- ◆ Introduction to Exercise #1: Situation Brief for Contingency Exercise: Civil Unrest and NEO Operation
- ◆ Contingency Operation – Deployment phases, Lessons learned: What would you have done differently during Phase 0 to prepare (site surveys, LN hospital operations, visits, exercises)
- ◆ CCMD and CCMD SG Office overviews
- ◆ OPLANs, Annex Q's and Exercise Planning

DAY 2

- ◆ Who's who in the zoo: What do I get when the Services show up to play? (Compare and contrast Role 2 and Role 3.)
- ◆ Joint logistics and blood
- ◆ Patient movement
- ◆ TMT panel (TMD/TPM): Lessons learned from recent deployment
- ◆ Medical operations planning
- ◆ Introduction to Exercise #2: Full scale operations and medical support and lessons learned. What would you have done differently to prepare during phase 0. (site surveys, LN hospital operations, visits, exercises)

JTET Turns its Attention to Highly Perishable Mission Essential Medical Skills (HPMEMS) Training

Here's how JTET plans to do it.

- ◆ Facilitate continuous stake-holder engagement, identify future HPMEMS requirements, and enable national trauma system.
- ◆ Optimize the direct care network as a readiness platform through evaluation of MTF pathways to trauma center verification and designation status.
- ◆ Create partnerships to optimize expeditionary medical skills development with a focus on HPMEMS.
- ◆ Recapture complex care workloads with emphasis on HPMEMS.
- ◆ Assess and enhance expeditionary medical skills training with focus on HPMEMS and simulation in support of Services Title 10 responsibilities.

Send inquiries to: DHA.JBSA.j-3.List.JTS-JTET@mail.mil

SAVE THE DATE	
COMBAT CASUALTY CARE	INDO-PACOM
MAR 31 <i>Lessons Learned</i>	APR 26 <i>NH Okinawa Trauma Capabilities</i>
APR 07 <i>Tactical Combat Casualty Care Updates</i>	MAY 24 <i>K9 Tactical Combat Casualty Care</i>
APR 14 <i>How AMEDD mobilized for WWII</i>	Info: margarita.carter.ctr@mail.mil



**SPEAK UP,
SAVE A LIFE**

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giselle.r.moody.ctr@mail.mil

Speakers wanted for Thurs Combat Casualty Care Conferences. Share your trauma care stories and lessons learned to improve battlefield care.

ARTICLES WHICH IMPACTED COMBAT CASUALTY CARE

JTS unofficially polled our trauma care partners and experts. JTS asked them what they considered to be the most influential papers in combat casualty care. Below are the answers.

Kotwal RS, Montgomery HR, Miles EA, et al. [Leadership and a casualty response system for eliminating preventable death](#). J Trauma Acute Care Surg. 2017 Jun;82(6S Suppl 1):S9-15.

Shackelford SA, Deljunco DJ, Powell-Dunford N, et al. [Association of pre-hospital blood product transfusion during medical evacuation of combat casualties in Afghanistan with acute and 30-day survival](#). JAMA. 2017;318(16):1581-1591.

Jenkins DH, Bailey JA. [Origins and importance of the joint trauma system](#). J Trauma Acute Care Surg. 2016 Nov;81(5 Suppl 2 Proceedings of the 2015 Military Health System Research Symposium):S75-S76.

Kotwal RS, Howard JT, Orman JA, et al. [The effect of a golden hour policy on the morbidity and mortality of combat casualties](#). JAMA Surg. 2016; 151(1):15-24.

Holcomb JB, Tilley BC, Baraniuk S, et al. [Transfusion of plasma, platelets, and red blood cells in a 1:1:1 vs a 1:1:2 ratio and mortality in patients with severe trauma](#). The PROPPR Randomized clinical trial. JAMA. 2015;313(5) 471-482.

Butler FK, Smith DJ, Carmona RH. [Implementing and preserving the advances in combat casualty care from Iraq and Afghanistan throughout the U.S. Military](#). J Trauma Acute Care Surg. 2015; Vol 79 (2):321-326.

USCENTCOM Joint Theater Trauma System-Afghanistan, JTS, USCENTCOM Command Surgeon. [Saving lives on the battlefield \(part II\) - one year later](#). JSOM. 30 May 2014; Vol(2):25-41.

Nessen SC, Eastridge BJ, Cronk D, et al. [Fresh whole blood use by forward surgical teams in Afghanistan is associated with improved survival compared to component therapy without platelets](#). Transfusion. 2013; 53 (Suppl 1):S107S-113.

Kotwal RS, Butler FK, Edgar EP, et al. [Saving lives on the battlefield. \(Report\) A Joint Trauma System Review of Pre-Hospital Trauma Care in Combined Joint Operating Area – Afghanistan](#). 2013 Jan; 13(1):77-85.

Kragh JF, Walters TJ, Westmoreland T, et al. [Tragedy into drama: an American history of tourniquet use in the current war](#). JSOM. Fall 2013; Vol 13 (3):5-25.

Eastridge BJ, Mabry RL, Seguin P, et al. [Death on the battlefield \(2001–2011\): Implications for the future of combat casualty care](#). J Trauma Acute Care Surg. 2012; 73(6 Suppl 5):S431-7.

Morrison JJ, Dubose JJ, Rasmussen TE, et al. [Military application of tranexamic acid in trauma emergency resuscitation study](#). Arch Surg. 2012; 147 (2):113-119.

Kragh JF Jr, Littrel ML, Jones JA, et al. [Battle casualty survival with emergency tourniquet use to stop limb bleeding](#). J Emerg Med. 2011 Dec; 41(6):590-597.

Kotwal RS, Montgomery HR, Kotwal BM, et al. [Eliminating preventable death on the battlefield](#). Arch Surg. 2011 Dec; 146(12):1350-8.

CRASH-2 trial collaborators. [Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant hemorrhage \(CRASH-2\): a randomized, placebo-controlled trial](#). Lancet. 2010; 376(9734):23-32.

Kragh JF Jr, Walters TJ, Baer DG, et al. [Survival with emergency tourniquet use to stop bleeding in major limb trauma](#). Ann Surg. 2009; 249:1-7.

Spinella PC, Perkins JG, Grathwohl JG, et al. [Warm fresh whole blood is independently associated with improved survival for patients with combat-related traumatic injuries](#). J Trauma. 2009; 66(Suppl 4):S69-76.

Borgman MA, Spinella PC, Perkins JG, et al. [The ratio of blood products transfused affects mortality in patients receiving massive transfusions at a combat support hospital](#). J Trauma. 2007; 63:805-813.

Holcomb JB, McMullin NR, Pearse L, et al. [Causes of Death in U.S. Special Operations Forces in the Global War on Terrorism 2001–2004](#). Annals of Surgery, 2007 Jun; Vol 245 (6): 986-991.

Kotwal RS, O'Connor KC, Johnson TR, et al. [A novel pain management strategy for combat casualty care](#). Ann Emerg Med. 2004; 44:121-127.

Mabry RL, Holcomb JB, Baker AM, et al. [United States Army Rangers in Somalia: an analysis of combat casualties on an urban battlefield](#). J Trauma. 2000; 49:515-529.

Butler FK, Haymann J, Butler EG. [Tactical combat casualty care in special operations](#). Mil Med. 1996; 161(3):3-16.

Bickell WH, Wall MJ, Pepe PE, et al. [Immediate versus delayed fluid resuscitation for hypotensive patients with penetrating torso injuries](#). NEJM. 1994 Oct; 17(331):1105-9.

Simmons RL, Collins JA, Heisterkamp CA, et al. [Coagulation disorders in combat casualties: acute changes after wounding, effects of massive transfusion, post-resuscitative changes](#). Annals of Surgery. 1969; 169(4):455-482.

Beecher HK. [Preparation of battle casualties for surgery](#). Annals of Surgery. 1945 Jun; 121(6): 769-792.

Cannon WB, Fraser J, Cowell E. [The preventive treatment of wound shock](#). JAMA. 1918; 70: 618-621.

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